

Работа №2. Язык SQL-DML

Выборка данных

- однотабличная выборка:
 1. Вывести все строки из журнала библиотекаря, дата возврата которых меньше некоторой даты.

```
SELECT * FROM JOURNAL WHERE DATE RET<TO DATE ('27-FEB-2020');
```

ID	BOOK_ID	CLIENT_ID	DATE_REG	DATE_END	DATE_RET
1	1	4	122-FEB-20 12.00.00.0000000000	AM 29-FEB-20 12.00.00.0000000000	AM 23-FEB-20 12.00.00.0000000000
2	2	2	201-FEB-20 12.00.00.0000000000	AM 22-FEB-20 12.00.00.0000000000	AM 19-FEB-20 12.00.00.0000000000

2. Посчитать количество книг, которых нет в наличии.

```
SELECT COUNT(*) FROM BOOKS WHERE CNT='0';
```


The screenshot displays two SQL query results in SQL Server Enterprise Manager. The first query, 'Query Result: 1', is a COUNT(*) query grouped by type_id, showing 1 row for type_id 1 and 0 rows for type_id 0. The second query, 'Query Result: 6', is a SELECT query listing books with their type_id, showing 6 rows with type_id 1 and 1 row with type_id 0.

ID	NAME	TYPE_ID	CNT
1	1R Riordan PJ	1	1
2	2Holy book	2	1
3	3JR Rowling HP	1	1
4	4High N Dry Math	3	1
5	5Books Zero	1	5
6	6The Underwater	0	1

The screenshot shows the SQL Server Enterprise Manager interface. The 'Script Output' and 'Query Result' tabs are visible at the top. The 'Query Result' tab is active, showing a single row with the value '1' for the 'COUNT(*)' query. The status bar at the bottom indicates 'All Rows Fetched: 1 in 0.001 seconds'.

- выборка с подзапросами:
 1. Вывести все книги типа «уникальные», которые на руках у читателей.

```
SELECT * FROM BOOKS WHERE ID IN
(SELECT BOOK_ID FROM JOURNAL WHERE BOOK_ID=BOOKS.ID AND
journal.date_ret is null)
AND TYPE ID IN (SELECT ID FROM BOOK TYPES WHERE NAME='Unique');
```



SQL | All Rows Fetched: 1 in 0.001 seconds

ID	NAME	TYPE_ID	CNT
4	High N Dry Math	3	1

- соединение таблиц (join):
 1. Вывести журнал библиотекаря, читателей, включая читателей, которые не брали книг и книги, включая книги, которых не выдавали.

```
SELECT * FROM JOURNAL
FULL OUTER JOIN  CLIENTS ON (JOURNAL.CLIENT_ID=CLIENTS.ID)
FULL OUTER JOIN  BOOKS ON (JOURNAL.BOOK ID=BOOKS.ID);
```

	ID_1	FIRST NAME	LAST NAME	PATNER NAME	PASSPORT_SERIA	PASSPORT_NUM	ID_2	NAME	TYPE_ID	CNT
1	0000000000000000	AM	(null)	1MarinaAlexeevaAndreevna	4141	111111		1R Riordan PJ		1
2	0000000000000000	AM	30-APR-20 12.00.00.0000000000	2Dasha AlexeevaVlad	5151	222222		1R Riordan PJ		1
3	0000000000000000	AM	19-FEB-20 12.00.00.0000000000	2Dasha AlexeevaVlad	5151	222222		2Holy book		2
4	0000000000000000	AM	(null)	2Dasha AlexeevaVlad	5151	222222		2Holy book		2
5	0000000000000000	AM	31-MAY-20 12.00.00.0000000000	1MarinaAlexeevaAndreevna	4141	111111		3R Fowlind HP		1
6	0000000000000000	AM	23-FEB-20 12.00.00.0000000000	1MarinaAlexeevaAndreevna	4141	111111		4High N Dry Math		3
7	0000000000000000	AM	(null)	2Dasha AlexeevaVlad	5151	222222		4High N Dry Math		3
8	(null)	(null)	(null)	(null)	(null)	(null)		5Books Zero		1
9	(null)	(null)	(null)	(null)	(null)	(null)		6The Underwater	(null)	(null)
10	(null)	(null)	(null)	3Dima VarlamovAndreevich	2222	333333	(null)	(null)	(null)	(null)
11	(null)	(null)	(null)	210Name OSur OPath	000001	455679	(null)	(null)	(null)	(null)

- для реализации проекта:
 1. Число книг на руках у заданного клиента.

```
SELECT COUNT(*) FROM JOURNAL WHERE DATE_RET is null AND CLIENT_ID IN
(SELECT ID FROM CLIENTS WHERE ID='2');
```

COUNT(*)
2

2. Размер штрафа заданного клиента.

```
SELECT CLIENTS.ID, CLIENTS.FIRST_NAME, CLIENTS.LAST_NAME,
(TRUNC (DATE_RET) -TRUNC (DATE_END)) *BOOK_TYPES.FINE AS FINAL
FROM JOURNAL
INNER JOIN CLIENTS ON JOURNAL.CLIENT_ID=CLIENTS.ID
INNER JOIN BOOKS ON JOURNAL.BOOK_ID=BOOKS.ID
INNER JOIN BOOK_TYPES ON BOOKS.TYPE_ID=BOOK_TYPES.ID
where JOURNAL.DATE_RET>JOURNAL.DATE_END AND CLIENTS.ID='1';
```

ID	FIRST_NAME	LAST_NAME	FINAL
1	Dasha	Alexeeva	10

3. Размер самого большого штрафа.

```
Select * From(
SELECT CLIENTS.ID, CLIENTS.FIRST_NAME, CLIENTS.LAST_NAME,
(TRUNC (DATE_RET) -TRUNC (DATE_END)) *BOOK_TYPES.FINE AS FINAL
FROM JOURNAL
INNER JOIN CLIENTS ON JOURNAL.CLIENT_ID=CLIENTS.ID
INNER JOIN BOOKS ON JOURNAL.BOOK_ID=BOOKS.ID
INNER JOIN BOOK_TYPES ON BOOKS.TYPE_ID=BOOK_TYPES.ID
where JOURNAL.DATE_RET>JOURNAL.DATE_END
ORDER BY FINAL DESC)
WHERE ROWNUM='1';
```

ID	FIRST_NAME	LAST_NAME	FINAL
1	Marina	Alexeeva	20

4. Три самые популярные книги.

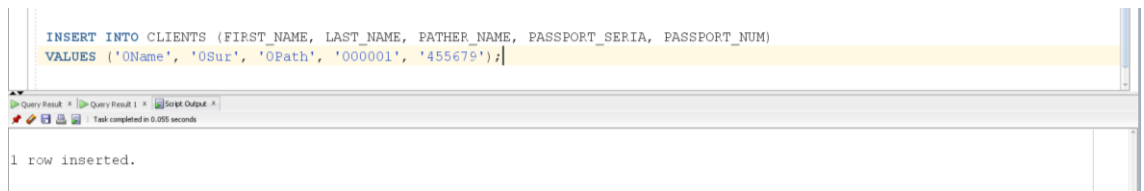
```
SELECT * FROM (SELECT BOOKS.ID, BOOKS.NAME, COUNT(JOURNAL.BOOK_ID) as kol
FROM BOOKS INNER JOIN JOURNAL ON JOURNAL.BOOK_ID = BOOKS.ID
GROUP BY BOOKS.ID, BOOKS.NAME, BOOKS.CNT, JOURNAL.BOOK_ID ORDER BY
COUNT(JOURNAL.BOOK_ID) DESC) WHERE ROWNUM<4;
```

ID	NAME	CNT
2	Holy book	3
4	High N Dry Math	2
1	Riordan PJ	2

Вставка данных

- однотабличная вставка:
 1. Добавить нового клиента.

```
INSERT INTO CLIENTS (FIRST_NAME, LAST_NAME, PATHER_NAME,
PASSPORT_SERIA, PASSPORT_NUM) VALUES ('0Name', '0Sur', '0Path',
'000001', '455679');
```



- многотабличная вставка в рамках транзакции:
 1. Добавить в рамках транзакции клиента, книгу и запись в журнал библиотекаря о выдачи книги этому клиенту.

```
begin
INSERT INTO CLIENTS (id,FIRST_NAME, LAST_NAME, PATHER_NAME,
PASSPORT_SERIA, PASSPORT_NUM)
VALUES (clients_seq.nextval,'1Name', '1Sur', '1Path', '000002',
'000002')
returning id into id_toret;
INSERT INTO BOOKS (ID, NAME,CNT,TYPE_ID) VALUES
('7','1BookRussian','1','1') returning id into id_toret2;
INSERT INTO JOURNAL (BOOK_ID,CLIENT_ID,date_beg,date_end,date_ret)
VALUES (id_toret2, id_toret,'1-MAY-2020','30-MAY-2020',NULL);
COMMIT;
end;
```

ID	BOOK_ID	CLIENT_ID	DATE_BEG	DATE_END	DATE_RET
1	4	122-FEB-20	12.00.00.0000000000	AM 29-FEB-20	12.00.00.0000000000
2	2	201-FEB-20	12.00.00.0000000000	AM 22-FEB-20	12.00.00.0000000000
21	3	122-MAY-20	12.00.00.0000000000	AM 29-MAY-20	12.00.00.0000000000
22	4	222-APR-20	12.00.00.0000000000	AM 29-APR-20	12.00.00.0000000000
23	2	201-APR-20	12.00.00.0000000000	AM 22-APR-20	12.00.00.0000000000
24	1	227-FEB-20	12.00.00.0000000000	AM 29-APR-20	12.00.00.0000000000
41	1	122-FEB-20	12.00.00.0000000000	AM 29-FEB-20	12.00.00.0000000000
41	7	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000

2. Добавить запись в журнал в случае, если книг у данного клиента больше 10, транзакцию откатить.

```
DECLARE
AMOUNT NUMBER;

begin
SAVEPOINT ins_journal;

INSERT INTO JOURNAL (BOOK_ID,CLIENT_ID,date_beg,date_end,date_ret)
VALUES ('2','41','1-MAY-2020','30-MAY-2020',NULL);

SELECT COUNT(*) into AMOUNT FROM JOURNAL WHERE CLIENT_ID IN (SELECT ID FROM
CLIENTS WHERE ID='41');

IF (AMOUNT<10) then

commit;

else

ROLLBACK TO ins_journal;

end if;

end;
```

Удаление данных

- удаление по фильтру и удаление из связанных таблиц:
 1. Удалить книги, не имеющие ссылок из записей в журнале.

```
DELETE FROM BOOKS
WHERE
ID NOT IN (SELECT BOOK_ID
FROM JOURNAL);
```

- удаление в рамках транзакции:

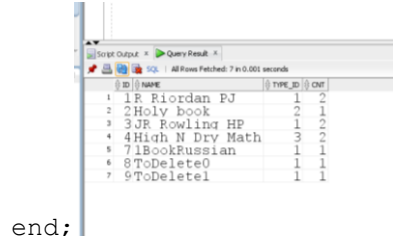
1. Удалить в рамках транзакции книгу и записи о ее выдаче.

```
begin
```

```
DELETE FROM journal WHERE book_id='8';
```

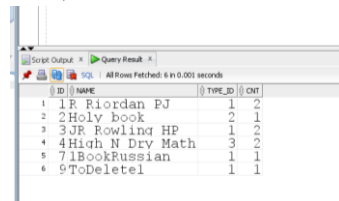
```
DELETE FROM BOOKS WHERE ID in (SELECT BOOK_ID FROM JOURNAL WHERE book_id='8');
```

```
Commit;
```



ID	NAME	TYPE_ID	CNT
1	R Riordan PJ	1	2
2	Holy book	2	1
3	JR Rowling HP	1	2
4	High N Dry Math	3	2
5	BookRussian	1	1
6	ToDelete0	1	1
7	ToDelete1	1	1

```
end;
```



ID	NAME	TYPE_ID	CNT
1	R Riordan PJ	1	2
2	Holy book	2	1
3	JR Rowling HP	1	2
4	High N Dry Math	3	2
5	BookRussian	1	1
6	ToDelete1	1	1

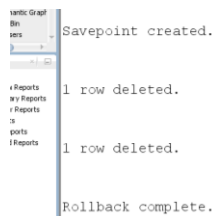
2. то же, что и п.1, но транзакцию откатить.

```
SAVEPOINT del_book_journal;
```

```
DELETE FROM journal WHERE book_id='10';
```

```
DELETE FROM BOOKS WHERE ID='10';
```

```
ROLLBACK TO del_book_journal;
```



```
Savepoint created.
1 row deleted.
1 row deleted.
Rollback complete.
```

Модификация данных

- модификация по фильтру:

1. Изменить количество книг, которые выданы заданному клиенту.

```
UPDATE BOOKS SET CNT = '2' WHERE ID in (SELECT BOOK_ID FROM JOURNAL WHERE CLIENT_ID='1');
```



ID	NAME	TYPE_ID	CNT
1	R Riordan PJ	1	1
2	JR Rowling HP	1	1
3	High N Dry Math	3	1

```
3 rows updated.
```



ID	NAME	TYPE_ID	CNT
1	R Riordan PJ	1	2
2	JR Rowling HP	1	2
3	High N Dry Math	3	2

- модификация в рамках транзакции:

1. В рамках транзакции поменять заданную книгу во всех записях журнала на другую и удалить ее.

```
UPDATE JOURNAL SET BOOK_ID='3' WHERE BOOK_ID='2';
DELETE FROM BOOKS WHERE ID='2';
COMMIT;
```

Script Output * Query Result: 1 * Query Result: 1 *
All Rows Fetched: 14 in 0.002 seconds

	ID	BOOK_ID	CLIENT_ID	DATE_BEG	DATE_END	DATE_RET
1	1	4	122-FEB-20	12.00.00.0000000000	AM 29-FEB-20	12.00.00.0000000000
2	2	4	201-FEB-20	12.00.00.0000000000	AM 22-FEB-20	12.00.00.0000000000
3	21	3	122-MAY-20	12.00.00.0000000000	AM 29-MAY-20	12.00.00.0000000000
4	22	4	222-APR-20	12.00.00.0000000000	AM 29-APR-20	12.00.00.0000000000
5	23	2	201-APR-20	12.00.00.0000000000	AM 22-APR-20	12.00.00.0000000000
6	24	1	227-FEB-20	12.00.00.0000000000	AM 29-APR-20	12.00.00.0000000000
7	41	1	122-FEB-20	12.00.00.0000000000	AM 29-FEB-20	12.00.00.0000000000
8	63	7	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
9	65	1	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
10	66	1	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
11	67	2	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
12	69	2	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
13	71	10	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
14	72	11	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000

Script Output * Query Result: 1 * Query Result: 1 *
All Rows Fetched: 14 in 0.001 seconds

	ID	BOOK_ID	CLIENT_ID	DATE_BEG	DATE_END	DATE_RET
1	1	4	122-FEB-20	12.00.00.0000000000	AM 29-FEB-20	12.00.00.0000000000
2	2	4	201-FEB-20	12.00.00.0000000000	AM 22-FEB-20	12.00.00.0000000000
3	21	3	122-MAY-20	12.00.00.0000000000	AM 29-MAY-20	12.00.00.0000000000
4	22	4	222-APR-20	12.00.00.0000000000	AM 29-APR-20	12.00.00.0000000000
5	23	2	201-APR-20	12.00.00.0000000000	AM 22-APR-20	12.00.00.0000000000
6	24	1	227-FEB-20	12.00.00.0000000000	AM 29-APR-20	12.00.00.0000000000
7	41	1	122-FEB-20	12.00.00.0000000000	AM 29-FEB-20	12.00.00.0000000000
8	63	7	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
9	65	1	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
10	66	1	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
11	67	2	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
12	69	2	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
13	71	10	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000
14	72	10	4101-MAY-20	12.00.00.0000000000	AM 30-MAY-20	12.00.00.0000000000

2. то же, что и п.1, но транзакцию откатить.

```
begin
```

```
SAVEPOINT s3;
```

```
UPDATE JOURNAL SET BOOK_ID='10' WHERE BOOK_ID='11';
```

```
DELETE FROM BOOKS WHERE ID='11';
```

```
ROLLBACK TO s3;
```

```
end;
```

